

IN THE CLAIMS:

1. (Original) A machine for handling tubular knitted articles, such as socks or the like, with a first end and a second end, comprising:

- at least one tubular member to transport the articles;
- a container in which said articles are randomly disposed;
- 5       - pick-up members to pick up individual articles from said container;
- a feed path of the articles;
- detection means to identify the orientation of the articles along said path;
- a stretching device to stretch open an end of an article and load said article onto  
said tubular member;

10       characterized in that it also comprises members to discard articles oriented with the first end farther forward than the second end with respect to the direction of feed of the article along said path, and to feed toward said stretching device articles oriented with the second end farther forward than the first end with respect to said direction of feed.

2. (Original) Machine as claimed in claim 1, wherein said first end and said second end are respectively the toe and the elastic band of the tubular knitted article.

3. (Original) Machine as claimed in claim 1, wherein said first end and said second end are respectively the band and the toe of the tubular knitted article.

4. (Currently Amended) Machine as claimed in ~~one or more of the previous claims~~ claim 1, wherein said pick-up members are multiple.

5. (Original) Machine as claimed in claim 4, wherein said detection means are multiple.

6. (Currently Amended) Machine as claimed in ~~one or more of the previous claims~~ claim 1, wherein said detection means are detection means are disposed along a trajectory of said pick-up members, said pick-up members being controlled to hold the articles oriented with the second end being the leading end and release into the container articles oriented with the first end being the leading end.

7. (Original) Machine as claimed in claim 6, wherein said pick-up members are provided with a vertical movement, said detection means being disposed along the vertical trajectory of said pick-up members.

8. (Currently Amended) Machine as claimed in ~~one or more of claims 1 to 5~~ claim 1, comprising along said feed path a conveyor, on which the articles picked up from said container by mean of said pick-up members are disposed, and wherein said detection means are disposed along said conveyor.

9. (Currently Amended) Machine as claimed in ~~one or more of the previous claims~~ claim

1, comprising a recirculation path, which extends from a position along said feed path towards said container.

10. (Currently Amended) Machine as claimed in ~~claims~~ claim 8 ~~and 9~~, wherein said recirculation path extends from a position along said conveyor toward said container.

11. (Currently Amended) Machine as claimed in claim 9 ~~or 10~~, wherein said recirculation path is a pneumatic path.

12. (Currently Amended) Machine as claimed in ~~one or more of the previous claims~~ claim 1, comprising a storage buffer for said articles, between the pick-up members and said stretching device.

13. (Currently Amended) Machine as claimed in ~~one or more of the previous claims~~ claim 1, comprising a plurality of tubular members, disposed and controlled to pass through a plurality of stations.

14. (Original) Machine as claimed in claim 13, wherein said tubular members are supported by a rotating assembly.

15. (Original) Machine as claimed in claim 14, wherein said rotating assembly rotates

about a vertical axis.

16. (Currently Amended) Machine as claimed in claim 13, ~~14 or 15~~, comprising a loading station, wherein said stretching device is disposed.

17. (Original) Machine as claimed in claim 16, wherein disposed in said loading station is at least one pair of retaining elements of the elastic band of the articles, movable in relation to each other, so that they can move toward and away from each other, said retaining elements engaging the elastic band of said tubular article to open it and prepare it to be picked up by said stretching device.

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18. (Currently Amended) Machine as claimed in ~~claims 4 and~~ claim 17, wherein disposed in said loading station are at least two pairs of retaining elements of the elastic band of the articles, each associated with a respective pick-up member.

19. (Original) Machine as claimed in claim 18, wherein said stretching device is positionable to cooperate alternately with one or with the other of said at least two pairs of retaining elements of the elastic band of the articles.

20. (Currently Amended) Machine as claimed in ~~one or more of claims 17 to 19~~ claim 17, wherein said pair of pairs of retaining elements of the elastic band of the articles are

mounted on an oscillating arm to take a first position to engage the elastic band and a second position to present the elastic band to said stretching device.

21. (Currently Amended) Machine as claimed in ~~one or more of claims 17 to 20~~ claim 17, wherein the pick-up members are disposed so that each article picked up is fed between the two retaining elements of said at least one pair.

22. (Currently Amended) Machine as claimed in ~~one or more of claims 17 to 21~~ claim 17, wherein said retaining elements of the elastic band of the articles are at least in part suction elements.

23. (Currently Amended) Machine as claimed in ~~one or more of claims 16 to 22~~ claim 16, wherein said loading station comprises a reversing device, to reverse the tubular articles.

24. (Currently Amended) Machine as claimed in ~~one or more of claims 13 to 22~~ claim 13, comprising a reversing station of the tubular articles, wherein a reversing device is disposed to reverse the tubular articles.

25. (Currently Amended) Machine as claimed in claim 23 ~~or 24~~, wherein said reversing device comprises at least one suction tube and one stretching member, said stretching member transferring the elastic band of the article onto the suction tube.

26. (Currently Amended) Machine as claimed in ~~one or more of claims 13 to 25~~ claim 13, comprising an orientation station of the tubular article to position a pocket of fabric of said tubular article in a specific angular position with respect to the tubular member over which it is inserted.

27. (Original) Machine as claimed in claim 26, wherein said orientation station comprises: at least one sensor positionable at the side of said tubular member in proximity to an end edge of said tubular member and suitable to detect the fabric of the tubular article; and an actuator to rotate the tubular member and said at least one sensor with respect to each other  
5 about the axis of the tubular member, a control unit being provided and programmed to determine the angular position of the tubular article on the basis of the signal of said sensor.

28. (Currently Amended) Machine as claimed in claim 26 ~~or 27~~, comprising a retaining member of the tubular article and means to rotate the article with respect to the tubular member or vice versa about the axis of the tubular member.

29. (Currently Amended) Machine as claimed in ~~one or more of the previous claims~~ claim 1, comprising a station to pick-up and transfer the tubular article to a rectilinear guide, said station comprising a pick-up member provided with a plurality of engaging elements of the toe or the article, disposed about the axis of the tubular member positioned in the pick-up and  
5 transfer station, and which have a variable geometry to take alternately a circular or polygonal

configuration and an essentially rectilinear flattened configuration.

30. (Original) Machine as claimed in claim 29, wherein said engaging elements are divided into a first series of elements and a second series of elements, in said flattened configuration the engaging elements of the two series taking a position wherein they are adjacent and opposite each other, with the toe of the article disposed therebetween in a flattened and essentially rectilinear configuration, the edge of the toe being divided into two edge portions aligned with and adjacent to each other.

31. (Currently Amended) Machine as claimed in claim 29 ~~or 30~~, wherein said pick-up member comprises at least one actuator to carry the engaging elements alternately to a flattened position and to an annular or polygonal position surrounding the axis of the loading member.

32. (Currently Amended) Machine as claimed in ~~one or more of the previous claims~~ claim 1, wherein said tubular members comprise extractable stretching means, to stretch the toe of the article, which impose a polygonal configuration on the toe of the article inserted over the tubular member.

33. (Original) Machine as claimed in claim 32, wherein said stretching means of the toe comprise a plurality of tabs, essentially parallel to the axis of the tubular member.

34. (Currently Amended) Machine as claimed in claim ~~32 or 33~~, wherein said stretching means are disposed and designed to impose a quadrangular configuration on the toe of the article, preferably rectangular and especially square.

35. (Currently Amended) Machine as claimed in claim ~~33 or 34~~, comprising four engaging elements of the toe of the article, coordinated with four extractable tabs.

36. (Currently Amended) Machine as claimed in ~~one or more of claims 32 to 35~~ claim 32, wherein said stretching means are movable parallel to the axis of the tubular member to transfer the toe of the article from the tubular member to the engaging elements of the toe.

37. (Currently Amended) Machine as claimed in ~~one or more of claims 29 to 36~~ claim 29, wherein said pick-up member has a plurality of needles designed and arranged to engage respective portions of the toe of the article.

38. (Original) Machine as claimed in claim 37, wherein extractors are associated with said needles to withdraw the article from the needles.

39. (Currently Amended) Machine as claimed in ~~one or more of claims 29 to 38~~ claim 29, wherein each of said engaging elements comprises a plate provided with a plurality of pick-up means of the toe of the article.



40. (Currently Amended) Machine as claimed in ~~claims 33 and~~ claim 39, wherein when the engaging elements are disposed in the polygonal configuration, each plate is disposed between two consecutive tabs.

41. (Currently Amended) Machine as claimed in claim 39 ~~or 40~~, wherein said pick-up means are constituted by needles.

42. (Currently Amended) Machine as claimed in claim 39 ~~or 40 or 41~~, wherein said plates are hinged to each other about axes essentially parallel to the axis of said tubular member.

43. (Original) Machine as claimed in claim 42, wherein said pick-up means of each plate are aligned according to a direction orthogonal to the hinge axes with which the respective plate is connected to the adjacent plate.

44. (Currently Amended) Machine as claimed in ~~one or more of claims 41 to 43~~ claim 41, wherein said needles are movable orthogonally to the respective plate.

45. (Original) Machine as claimed in claim 44, wherein each plate is provided with a plurality of holes inside which said needles penetrate.

46. (Currently Amended) ~~Method to feed tubular knitted articles having a first end and~~

~~a second end to a work station, comprising the steps of:~~

~~- picking up individual articles from a plurality of articles disposed randomly in a container;~~

5 ~~- feeding the articles along a feed path toward a work station;~~

~~- for each article, determining which of said first and said second end is the leading end along said path, with respect to the direction of feed;~~

~~- feeding the articles oriented with the second end being the leading end to said work station and discarding the articles which are oriented with the first end~~

10 ~~being the leading end.~~ A device for aligning an edge of a knitted tubular article, including:

~~- a tubular member for receiving said knitted tubular article, said tubular member having a front end and a side wall;~~

15 ~~- an operative head, arranged in front of said front end of said tubular member; said operative head and said tubular member being arranged and controlled to move one towards and away from one another along a direction substantially parallel to the axis of said tubular member;~~

~~- a plurality of contacting members on said operative head, movable towards said side wall of the tubular member.~~

47. (Currently Amended) ~~Method as claimed in~~ Device according to claim 46, wherein ~~said discarded articles are returned toward said container,~~ each contacting member is provided

with a sensor for detecting the edge of the knitted tubular article.

48. (Currently Amended) ~~Method as claimed in claim 46 or 47, wherein said first end is a toe to be closed of said articles and said second end is an elastic band.~~Device according to claim 47, wherein each contacting member is controlled by a signal generated by the corresponding sensor to approach said tubular member.

49. (Currently Amended) ~~Method as claimed in claim 46 or 47, wherein said first end is an elastic band and said second end is a toe to be closed.~~Device according to claim 46, wherein a plurality of said contacting members are controlled by corresponding actuators for individually and selectively move each said contacting member toward said side wall of the tubular member.

50. (Currently Amended) ~~Method as claimed in one or more of claims 46 to 49, comprising the step of creating a storage magazine of articles along said feed path.~~Device according to claim 48, wherein a plurality of said contacting members are controlled by corresponding actuators for individually and selectively move each said contacting member toward said side wall of the tubular member, said actuators being controlled by a signal generated by the corresponding sensor.

51. (Currently Amended) ~~Method as claimed in one or more of claims 46 to 50, wherein~~

~~in said work station each article is positioned on a tubular transport member.~~Device according to claim 50, wherein each contacting member is controlled to move towards said tubular member when the corresponding sensor detects the edge of the knitted tubular article.

52. (Currently Amended) ~~Method as claimed in claims 48 and 51 or 49 and 51, wherein each article is positioned on the tubular transport member stretching the elastic band of said article and inserting the toe to be sewn of the article over the end of said tubular member.~~Device according to claim 46, wherein a plurality of said contacting members include pressure pads.

53. (Currently Amended) ~~Method as claimed in claim 52, comprising the steps of:~~

- ~~— stretching said article over said tubular member so that an intermediate part of a band surrounding said toe is disposed along a line intersecting in two points the end edge of the tubular member and the remaining part is disposed along the outside surface of the tubular member;~~
- ~~— detecting the angular position of said band on the tubular member;~~
- ~~— identifying the angular position of a pocket of fabric on the basis of the angular position of said band with respect to the tubular member.~~Device according to claim 46, wherein each said contacting member is supported by a corresponding oscillating lever.

54. (Currently Amended) ~~Method as claimed in claim 53, characterized by the steps of:~~

- ~~- determining the angular positions of two portions of said band adjacent to the end edge~~Device according to claim 46, wherein a plurality of said contacting members are supported by a common supporting member, said supporting member being movable under the control of an actuator in a direction substantially parallel to the axis of the tubular member and disposed on the outside surface of said tubular member;
- ~~- identifying the angular position of the pocket of fabric in the intermediate area between said two angular positions.~~

55. (Currently Amended) ~~Method as claimed in claim 53 or 54, comprising the steps of:~~

- ~~- disposing the tubular knitted article with the toe in an open configuration;~~
- ~~- engaging a first border of the edge of the toe in~~A method for aligning the edge of a knitted tubular article, including the following steps:
- ~~- providing a tubular member with an axis, a front end and a side wall;~~
- ~~- arranging a plurality of positions and a second border of the edge of the toe in a further plurality of positions;~~
- ~~- placing the first border and the second border of the edge adjacent to each other to give the toe an essentially rectilinear flattened configuration.~~

contacting members around the axis of said tubular member;

- ~~- placing said knitted tubular article on a tubular member, with a first portion of~~

said edge on the front end of said tubular member and a second portion of said edge on the side wall of the tubular member;

- moving said contacting members towards said tubular member in a direction substantially parallel to said axis;
- selectively contacting said knitted tubular article with said contacting members;
- bringing the edge of said knitted tubular article approximately in alignment on a plane substantially orthogonal to said axis by causing said tubular article to slip along the side wall of said tubular member.

56. (Currently Amended) Method ~~as claimed in~~ according to claim 55, wherein said ~~open toe is disposed in a polygonal configuration wherein consecutive portions of the edge of the toe are disposed approximately according to the sides of a polygon, and wherein each side of said polygon is engaged by a respective engaging element, the sides of the polygon being aligned so that the toe takes said essentially rectilinear flattened configuration.~~ contacting members are selectively moved towards said tubular member while moving along said direction substantially parallel to the axis of said tubular member.

57. (Currently Amended) ~~Method as claimed in claim 56, wherein said polygon is a quadrangle, preferably a rectangle, and even more preferably a square.~~ A device for aligning an edge of a knitted tubular article, including a tubular member for receiving said knitted tubular article; an operative head, arranged in front of said front end of said tubular member and

5      movable towards said tubular member; a plurality of contacting members on said operative head, movable towards a side wall of the tubular member.

58 - 59 (Canceled)